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## REMOTE HOOK SUPPLIERS

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### BACKGROUND

Remote hook systems are used to attach external loads to the cargo hook of a helicopter. A complete remote hook system includes one 50-ft suspension cable section and one 100-ft suspension cable section, a remote cargo hook, a protective cage and handgrip for the remote cargo hook, electrical cable for the operation of the remote cargo hook, electrical pigtail, and appropriate attaching hardware. Remote hook systems are described in the San Dimas Technology and Development Center (SDTDC) May 1984 *Project Record* No. 8457 1203, "Remote Hook Systems for Helicopters."

### Availability of Remote Hooks

A search for current manufacturers and distributors of remote hooks was conducted. Availability, pricing, and compliance with USDA Forest Service standard 5100-500e were investigated. The majority of the manufacturers located provide just the remote hook and cage. Companies located that currently manufacture remote hooks, and meet the requirements of 5100-500e, are CANAM Tool and Engineering Inc., Mechanical Specialties, H-S Tool and Parts Inc., and F+W Emmen, Swiss Federal Aircraft Factory.

Other companies exist that manufacture or market remote hooks, but do not meet all of the criteria of standard 5100-500e—such as the self-latching requirement.

### Summary List of 5100-500e Requirements

Refer to standard 5100-500e for a complete listing of the requirements for remote hook systems. Typical requirements of 5100-500e include:

- Can operate in a temperature range of 0° to 140° F.
- Not be impaired by adverse environmental conditions such as dust, moisture, chemicals, etc.
- Hardware to have an ultimate strength of 1.5 times the safe working load.

- Must be self-latching.
- Electrical system must be compatible with 28-volt supply.
- Hook must carry its rated load with no electrical load and release the load with a current draw of less than 20 amps.

### SPECIFIC MANUFACTURERS

#### **CANAM Tool and Engineering Inc.**

CANAM manufactures 2,000-, 6,000-, 10,000-, and 20,000-lb remote hooks. All hooks are compatible with 24/28 volts dc, and draw no more than 15 amps of current when activated. The solenoid is interchangeable among the three largest models. All models are self-latching, and are proof-tested to three times the rated load. Different styles of load beams are available, with corresponding price adjustments. Remote hook guards are available for all models, and feature roll-over protection that prevents the load beam from impact at touchdown. The guards are made of welded tubular steel, and incorporate a solenoid protector. CANAM has recently simplified each of the hook designs by using fewer parts. The 6,000-lb capacity CANAM remote hook with guard is shown in figure 1. Table 1 lists model prices and weights for hooks and appropriate guards.

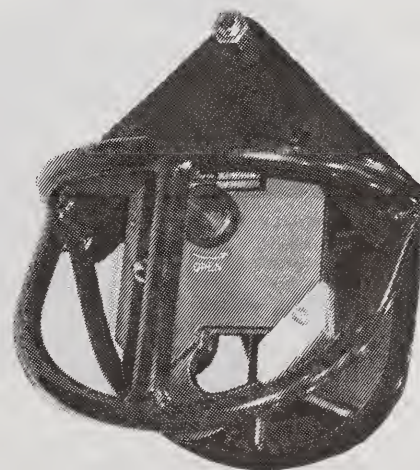


Figure 1. 6,000-lb capacity (CAN-6k-001) CANAM Tool & Engineering remote hook.





Table 1 Weights and prices for hooks with guard

Part Number	Rated capacity (lb)	Weight (lb)	Price hook/guard (U.S. \$)	Total price (U.S. \$)
CAN-2K-001	2,000	5	1,300/350	1,650
CAN-6K-001	6,000	25	2,000/380	2,380
CAN-10K-001	10,000	30	3,370/380	3,750
CAN-20K-001	20,000	52	8,100/400	8,500

### Mechanical Specialties

Mechanical Specialties manufactures and markets a 3,000-lb (model 3-1), 6,000-lb (model 6-1), 9,000-lb (model 9-1) and a 12,000-lb (model 12-1) capacity remote hook with guards. The hooks are tested to over five times rated capacity, which exceeds the requirements of 5100-500e (ultimate load to be 1.5 times the safe working load). All hooks have a maximum current draw of 14 amps and are self-latching. The 3,000-lb hook has a guard height of 9.5-in with a 10-in diameter; the total weight of the hook and guard is 13 lb. For the 6,000- and 9,000-lb hook, the guard height is 14-in with a 15-in diameter; the total weight of the hook and guard is 27 and 36 lb, respectively. Guard height and diameter are 15 by 16 in for the 12,000-lb hook, with a total weight of 51 lb.

The remote guards are constructed from 3/4-in schedule 40 mild steel pipe. Fasteners used are AN hardware. A model 9-1 remote hook is shown in figure 2.

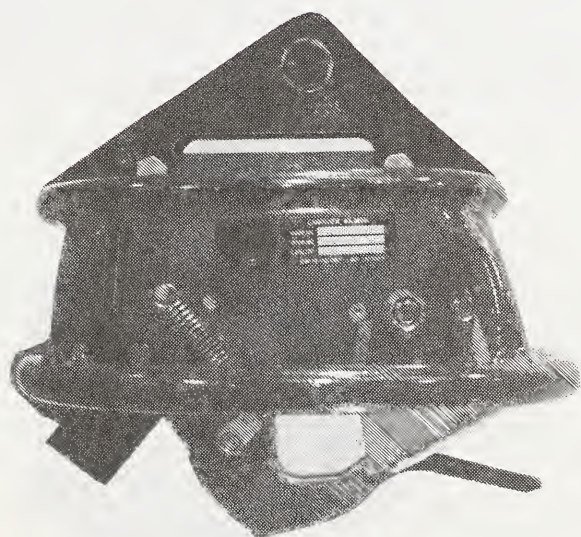


Figure 2. 9,000-lb capacity (model 9-1) Mechanical Specialties remote hook.

Hooks and guard are available 24 hr from the time of order. Pricing for the hooks with guard is shown in table 2.

Table 2. Prices for hooks with guard

Safe working load (lb)	Model	Price (\$)
3,000	3-1	1,950
6,000	6-1	2,750
9,000	9-1	3,650
12,000	12-1	4,950

### H-S Tool and Parts Inc.

The 20,000-lb remote hook built by H-S Tool and Parts is designed to withstand the hard use found in heavy-lift operations such as logging and construction. Aircraft-quality AN and MS hardware is used in the hook design. Safe working load requirements are exceeded with the hooks tested to 80,000 lb (four times safe working load). The company is planning on marketing a 6,000-lb capacity hook.

Operating voltage is 24/28 v dc, and maximum current draw is less than 12 amps. The hook is self-latching, and various load beam designs are available. Total weight of hook and guard is 54 lb. Each hook is made to order with an approximate price of \$20,000 and a 2 to 4 mo lead time. There is a discount for quantity orders.

H-S Tool and Parts also manufactures vibration dampers and conductive swivels for use in helicopter longline operations.

### **F+W Emmen, Swiss Federal Aircraft Factory**

The CH-6000 remote cargo hook carries loads up to 13,500 lb, with a design safety factor of 4.5; and is of an extremely high quality construction and rugged design. Two solenoid actuators provide quick load beam release, with automatic relatch after release. The load beam has a large support surface, and once loaded remains in the locked position unless the release voltage is applied. Handles can be easily grasped and can be placed in two locations; either extending to the sides, or rotated ninety degrees to extend below the hook. The hook's mechanical housing is made of metal (center part of hook) and is protected by two side covers made of impact-resistance synthetic material.

The company also manufactures a non-metallic longline that has an exchangeable electrical lead internal to the line, designed to be used with the CH-6000 hook. The hook and the longline are connected mechanically by a pin bolt secured with an aircraft safety pin, and are electrically connected at the same time by spring-loaded pins.

The hook could be connected to standard suspension cables by modifying the electrical connection.

This hook meets all of the requirements of 5100-500e with the exception of the electrical connection. All of this high quality is not inexpensive; price is available upon request.

### **SUMMARY**

Of the four remote hook suppliers located, the hooks currently marketed by CANAM Tool and Engineering and Mechanical Specialties are the most likely to meet Forest Service lifting capacity and price needs. Table 3 summarizes the hooks available from all of the suppliers reviewed.

Table 3. Summary of available hooks

Company	Load rating (lb)	Price of hook with guard (\$)
Mechanical	3,000	1,950
Specialties	6,000	2,750
	9,000	3,650
	12,000	4,950
CANAM Tool & Engineering	2,000	1,650
	6,000	2,380
	10,000	3,750
	20,000	8,500
H-S Tool & Parts	20,000	20,000
F+W Emmen, Swiss Federal Aircraft Factory	13,500	40,000

### **ADDITIONAL INFORMATION**

Additional information regarding the remote hooks can be obtained from the manufacturers. Addresses and telephone numbers are provided below.

#### **CANAM Tool & Engineering Inc.**

No. 6, 9761, 192nd Street  
Surrey, B.C., Canada V3T 4W2  
Tel: (604) 888-7699  
Fax: (604) 888-5944.

#### **Mechanical Specialties**

E 841 Mason Benson Road  
Grapeview, WA 98546  
Tel: (206) 275-6228  
Fax: (206) 275-2046.

#### **H-S Tool & Parts Inc.**

No. 140 - 2560 Simpson Road  
Richmond, B.C., Canada V6X 2P9  
Tel: (604) 273-4743  
Fax: (604) 273-0924.

#### **F+W Emmen, Swiss Federal Aircraft Factory**

Swiss Liaison Office  
Redstone Arsenal  
Bldg. 3433, Room 161  
Huntsville, AL 35898  
Tel: (205) 876-2338/2613  
Fax: (205) 876-5221.

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